



The Future of Flexible Energy Systems - Flex4RES intro

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Publication date:
2017

Document Version
Publisher's PDF, also known as Version of record

[Link back to DTU Orbit](#)

Citation (APA):
Skytte, K. (Author). (2017). The Future of Flexible Energy Systems - Flex4RES intro. Sound/Visual production (digital)

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Flex4RES
Flexible Nordic Energy Systems



Flex4RES

The Future of Flexible Energy Systems

Workshop
KTH, Stockholm 28 November 2017

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**Nordic Energy Research
Nordic Council of Ministers**

The Future Energy System

Goals and RE-thinking of the Nordic Energy Co-Operation

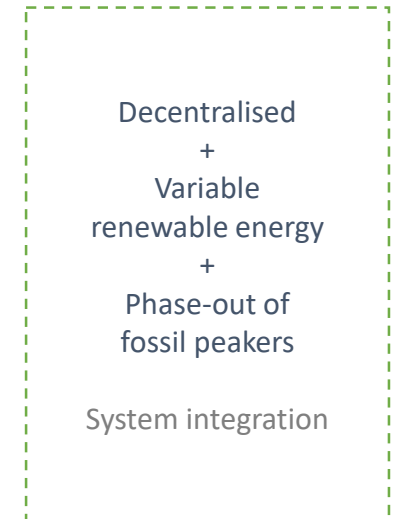
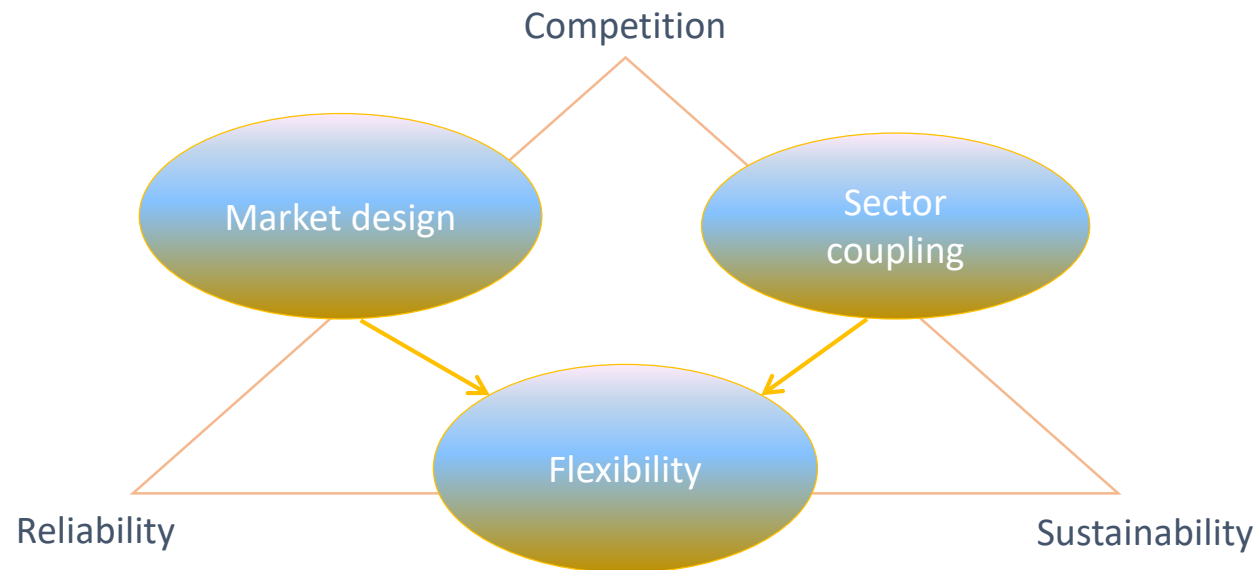


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Current
electricity system

The trichotomy
of energy policy

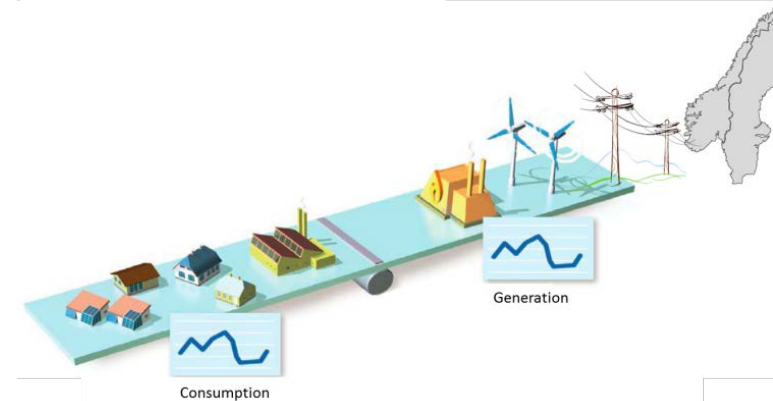
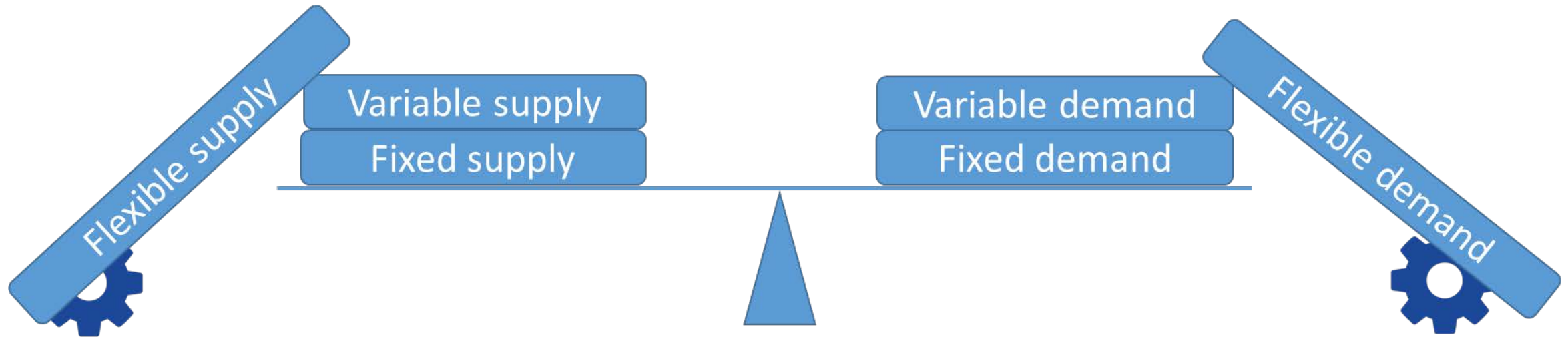
Decarbonised
energy systems



Flexibility definition



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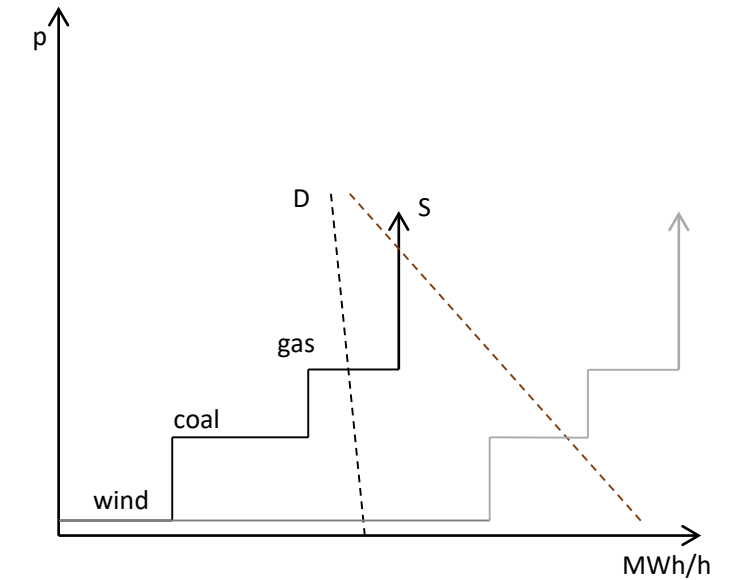
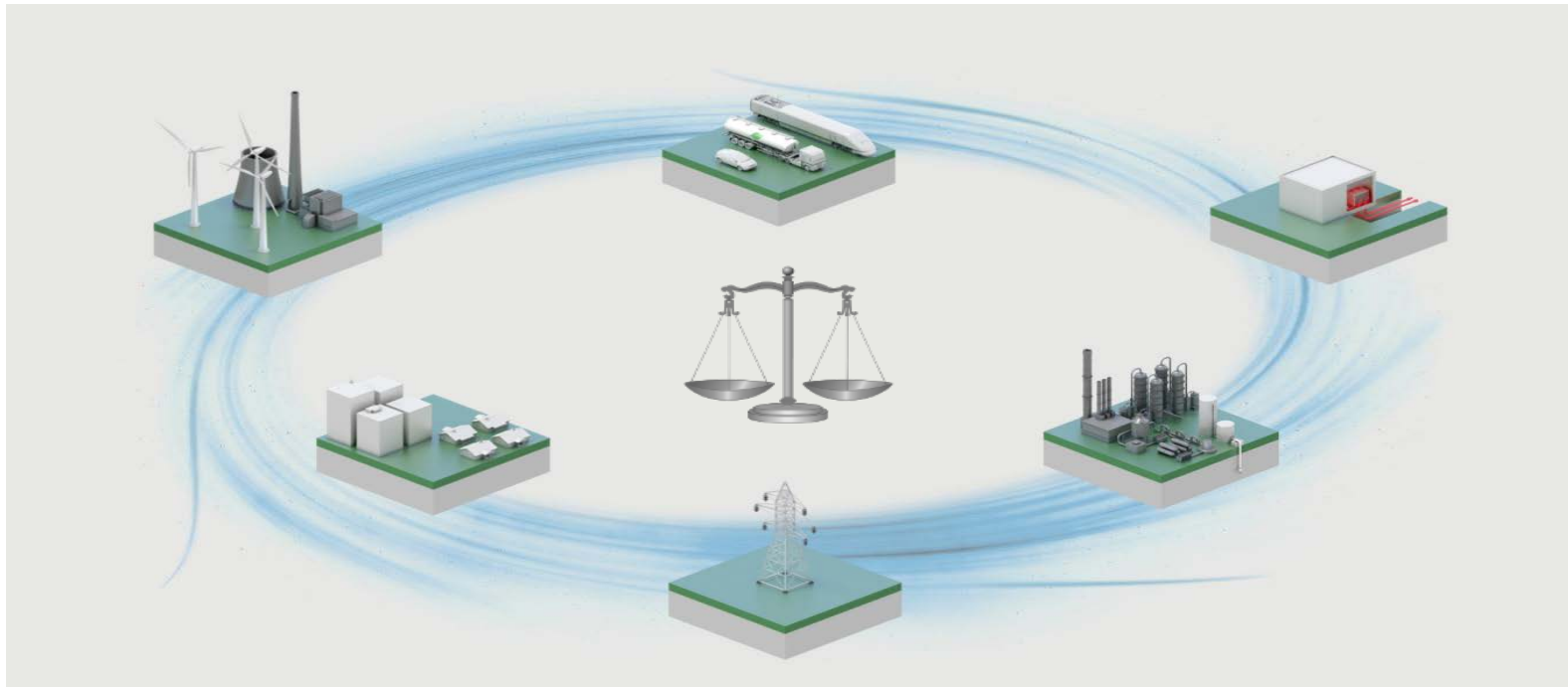
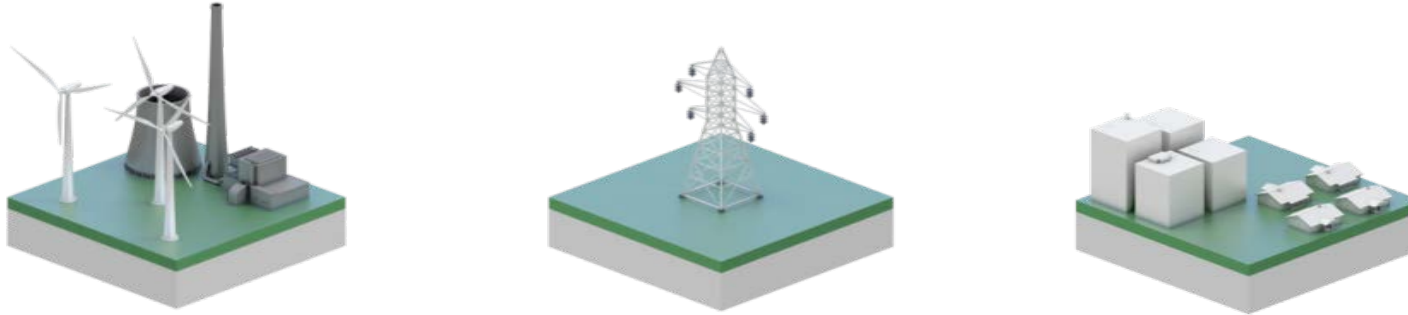


Flexibility Resources/Market Actors

Electrification/sector coupling - Finding ramping capabilities



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The primary objective of Flex4RES is to

Identify and assess regulatory and technical pathways towards coherent Nordic energy systems

The secondary objectives are to:

- a) **Estimate the potentials and costs of flexibility** in the Nordic power market created by the coupling of and increased interaction between different energy markets (electricity, heat, gas and transportation).
Estimate the need for flexibility in the future Nordic power market.
- a) **Identify regulatory and technological barriers.**
- b) **Develop coherent regulatory frameworks and market designs** that facilitate energy market couplings that are optimal for the Nordic conditions in an EU context.
- a) **Adapt a high-resolution Nordic energy market model** covering heat, power and transport for quantification of the impacts of different market couplings, regulatory frameworks and market designs.
Estimate the cost and benefits of a coherent energy system framework.

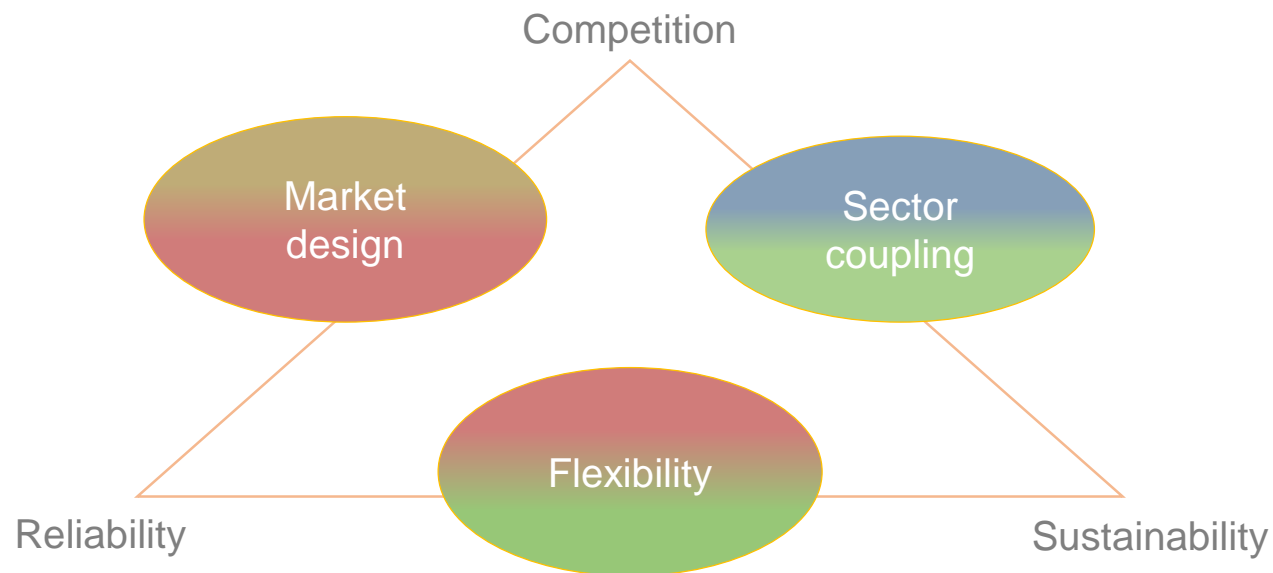
Nordic Energy Co-Operation

Policy Scenarios towards 2050



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The Future of Flexible Energy Markets
We agree where we want to be in 2050
The question is **how** we get there
Strong today - Stronger tomorrow



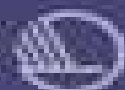


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Flexible Nordic Energy Systems

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Nordic Energy Research
Nordic Council of Ministers

Today



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- 13.15 **Major flexibility potentials in the Nordic/Baltic region**
Lennart Söder, KTH, Sweden.
- 13.30 **The future flexible, decarbonised, and coherent energy markets.**
Barriers and policy/technology scenarios
Klaus Skytte, DTU, Denmark.
- 13.50 **Benefits of flexible use of electricity in the district heating sector.** Preliminary results from the energy system modelling activities
Torjus Folsland Bolkesjø, NMBU, Norway.
- 14.15 **Coffee break**
- 14.30 **Policy/technology initiatives to a well-functioning energy market**
Farid Karimi, Aalto, Finland.
- 15.00 **Perspectives on the pathways for improved flexibility in the Nordic and Baltic energy system** Round table discussion
- 16.40 **Summing up.**
- 17 End of workshop



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